IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
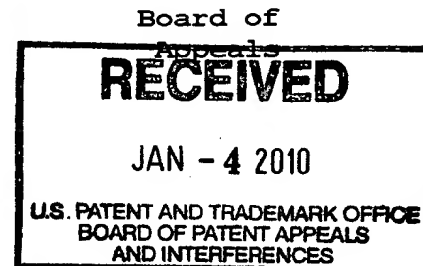
Appellant: ALGIRDAS AVIZIENIS

Appeal No.:   2009-003592

Serial No.:   09/886,959

Filed: June 20, 2001

Title: "SELF-TESTING AND -REPAIRING FAULT-TOLERANT INFRASTRUC-TURE FOR COMPUTER SYSTEMS"

Our docket: xAAA-02

Board of

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U.S. PATENT AND TRADEMARK OFFICE
BOARD OF PATENT APPEALS
AND INTERFERENCES

Judge St. John
Courtenay III

REQUEST FOR RECONSIDERATION
BY THE BOARD OF APPEALS

Hon. Commissioner of Patents and Trademarks
Postoffice Box 1450
Alexandria VA   22313

Dear Sir:

Appellant notes that the Decision on Appeal issued November 2, 2009 contains two new grounds of rejection, in the paragraph bridging pages 26 and 27.

The undersigned apologizes for not knowing whether this paper should be sent directly to Examiner Bonzo, or directly

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CERTIFICATION OF EXPRESS-MAIL DEPOSIT
FOR THE PURPOSE OF SECURING ADVANCED FILING DATE

U. S. Express Mail mailing label: EG 134 463 645 US
Date of deposit: January 4, 2010

I hereby certify that this document is being deposited with the United States Postal Service under 37 CFR 1.10 on the date indicated above, and is addressed to the Commissioner for Patents, Box 1450, Alexandria VA   22313.

Signed,

Peter V. Lippman

to the Board. For the convenience of the Examiner and the Board, the substance of this document is being sent to both.

The Appellant sincerely wishes to thank the Board, and particularly Judge St. John Courtenay III, for having brought an increased degree of orderliness and reason to this case. Appellant finds that the Decision of the Board is very helpful in comprehending the issues presented.

NEW GROUND OF REJECTION

The Decision at pages 26 and 27, however, asserts (emphasis added):

> "We find the Examiner's proffered combination of Best and Avizienis is merely a combination of familiar elements (i.e., a network of components having terminals, circuits for operating programs to guard the system from failure, and circuits for reacting to an error message (cf. claim 33)) according to known methods that yields a predictable result."

With respect, this passage both is factually inaccurate and is a new ground of rejection — because it goes well beyond the Examiner's assertions. First as to inaccuracy:

- The Best patent uses a table-lookup, which is not a program, to compare data from Best's different communications channels (the tables appear in column 7, full column) — and are discussed in column 6, lines 15 through 27). Thus Best's hardware circuits do not operate any program to guard his system from failure.

- The Avizienis paper describes an academic software experiment, called "DEDIX" — which had no "network",

no "component" and very plainly no terminal: it was
entirely software (see, *e. g.*, Examiner's Answer at
page 16, lines 1 through 8).

Again, Avizienis's DEDIX programs (software) did not
have any "network of components having terminals" and also
did not have "circuits" for any purpose whatsoever. DEDIX
was a software system composed of instructions that were
assembled into programs (not circuits), and programs cannot
have "terminals". "Circuits" and "terminals" are physical
entities (hardware) while instructions and programs are
abstract entities.

Thus the Appellant humbly submits that the Board Deci-
sion is factually inaccurate. Appellant most respectfully
asks the Board to confirm that it is a factual error to as-
sume, or to hold, that a table-lookup is a "program" or that
software has circuits and terminals. These faulty assump-
tions pervade and color all § 103 rejections in this case.

Here the Appellant is not "attacking references indi-
vidually" but rather is questioning the propriety of the
combination. To reiterate, more specifically, the Decision
finds "a combination of":

- "a network" and "terminals"; together with
- "circuits for operating programs";

— but DEDIX had none of these hardware pieces, and neither
reference has "circuits for operating programs",

ANOTHER NEW GROUND OF REJECTION

Further, in the Board Decision, at the top of page 27,
it is also asserted (emphasis added):

> "[B]oth the Best and Avizienis references are di-
> rected to the <u>same field of endeavor</u> as the in-
> stant invention on appeal, i.e., <u>fault-tolerant</u>
> <u>computer systems</u>, and are thus analogous art."

This assertion, <u>not made by the Examiner</u>, is a new ground of
rejection.

This "same field of endeavor" assertion might possibly
be true in purest principle, *i. e.* in some idealized sense
of the phrase "directed to". Only in the lofty sense of be-
ing "aimed" at some common but extremely remote goal, can
the Best patent and the Avizienis paper be at all reasonably
characterized as "directed to" a single common field — such
as "fault-tolerant computer systems".

Patents, however, in their ideal form are not about
pure or lofty principle — they are about practicalities,
about pragmatic solutions to real-world practical problems.
The present invention is a practical, buildable, badly nee-
ded device for deterring <u>actual</u> failure of <u>entire, actual</u>
computing systems.

Without a patent it may never be built. The patent
system, as our Constitution tells us, exists "to promote the
progress of the useful arts." It does so by offering — to
inventors and investors, and manufacturers too — <u>incentive</u>:
a temporary monopoly, to invent and invest, and build.

In contrast to the present invention, both the Best
patent and the Avizienis '85 paper are only fragmentary
gestures in the direction of entire computing systems that
are fault tolerant. <u>Neither</u> of these references <u>is</u> itself
even fully <u>in</u> that field:

- THE PATENT TO BEST teaches <u>not</u> a fault-tolerant computer
  system — only a fault-tolerant <u>communications</u> SUBsys-

tem. Nothing in Best actually protects his whole com-
puter system.

Guarding one subsystem against faults is <u>not</u> pro-
tecting an entire system — against *e. g.* failure of
its processor(s), or against an avalanche of gamma rays
slicing through a host vehicle, or against corrupt ope-
rating-system software. (The present invention <u>does</u>
perform these critical functions, and many more.)

Thus, the assertion in Best's Abstract that he in-
vented a "fault tolerant, fail-active <u>computer system</u>"
is untrue — notwithstanding, with greatest respect,
the corresponding Finding of Fact in the Board's Deci-
sion. The truth is that Best's invention, built of
digital hardware, is at most capable of use as only
<u>part of</u> a complete fault-tolerant computer system.

The art of designing computer hardware is commonly
known as "digital design" or "computer hardware engi-
neering" and is the art practiced by computer hardware
engineers. These designations of field in this art
will be compared, below, with analogous designations
for the DEDIX experiment.

■ THE AVIZIENIS PAPER describes <u>not</u> a fault-tolerant compu-
ter system — only an ordinary distributed software
system ("a distributed supervisor and testbed. . . ."
Avizienis, at 1496). Unlike various mischaracteriza-
tions of record, "DEDIX" was merely a <u>tool</u> for conduct-
ing *N*-version <u>programming experiments</u>.

The DEDIX programs (software) was programmed by
computer programmers, whose art is nowadays commonly
known as "software engineering".

These two art forms, "digital design" (or "computer hardware
engineering") and "software engineering", are completely

distinct and different. Very few people have even "ordinary" skill (*e. g.* technician-level skill) in both.

To prove the distinctiveness, it is only necessary to browse defining literature and educational/workforce planning for the two fields:

- For engineering in general, please note the *Occupational Outlook Handbook, 2010-11 Edition* published by the Bureau of Labor Statistics of the U. S. Dept. of Labor (www.bls.gov/oco/). In listing professions, the major section *Engineers* (www.bls.gov/oco/ocos027.htm) shows seventeen official classes of engineering profession.

  Included are "*computer hardware engineers*". Most remarkably, however, the class "*computer software engineers*" is <u>not</u> even one of those seventeen!

  Instead, there exists a separate major section, "*Computer Software Engineers and Computer Programmers*" (www.bls.gov/oco/ocos303.htm). That separate section explains the nature of work in that profession.

- Alternatively, for computing perspective the Appellant respectfully calls attention to the publication *Software Engineering 2004* (http://sites.computer.org/ccse/) by the IEEE Computer Society and the Association for Computing Machinery.

  The introductory "Overview" section of that publication lists four undergraduate curricula: " . . . one for each major area of computing: a Computer Science Volume, a Computer Engineering Volume, a Software Engineering Volume, and an Information Systems Volume."

The important points here are that <u>separate</u> undergraduate curricula exist for software engineering and computer (hardware) engineering — so that <u>it would take two degrees</u> to achieve the most basic recognized professional-level

skill in both professions. These facts relate to "the"
field of fault-tolerant computing systems, and arise from
the extreme difficulty and complexity of both software
engineering and computer hardware engineering. These diffi-
culties and complexities make the field of fault-tolerant
computing systems nearly unique.

Hence, once again with great respect, the statement, in
the Decision, that:

> "the Best and Avizienis references are directed to
> the <u>same field of endeavor</u> as the instant inven-
> tion on appeal, i.e., <u>fault-tolerant computer
> systems</u>, and are thus analogous art"

may be meaningful in purest principle — but as a <u>practical</u>
matter is not. Best combined with Avizienis does not really
teach artisans of ordinary skill how to build fault-tolerant
computer systems.

If it did, then it would be reasonable to expect by now
(nineteen years after Best and a quarter-century after the
Avizienis experiment) to see such devices in the marketplace
— or, without patents, at the very least in military appa-
ratus. As we can see easily, the proposed Best+Avizienis
combination does not suffice — not for avionics, not for
spacecraft, and certainly not for our desktop or laptop
computing systems.

Continuing into the next paragraph in the Decision, it
is further said that the combination of references is proper
(emphasis added):

> "[W]e are not persuaded that combining the respec-
> tive familiar elements of the cited references in
> the manner proffered by the Examiner was 'uniquely
> challenging or difficult for one of <u>ordinary skill
> in the art</u> [citation]'".

The daunting issue of what "the art" means has been explored above. The mind-bending question of what constitutes "ordinary skill" in "the" art is probably beyond our resources, but the Appellant respectfully offers the following thoughts.

Best's patent is in the hardware field. As can be noted, his patent says little or nothing about software details. Being a hardware man, Best doubtless <u>knew</u> little about software.

What makes the excerpts in the Decision a "new ground of rejection" is that the Examiner's stance is far more restrained than that in the Decision. Examiner Bonzo wrote in his Answer (paragraphs bridging pages 15 and 16, emphasis added):

> "2. Best does not disclose, while Avizienis teaches:
> "at least one of the <u>network</u> <u>terminals</u> is connected to receive one error signal generated by such system in event of incipient such failure of such a system (page 1498 describes how the Decision and Executive layer receives exceptions from the version layer indicating errors within the instance running that particular version of the software);"

The Examiner's description never ventures as far as the Decision does. At first, the Decision says only that "one of the" network terminals is connected to receive an error signal — but, <u>what</u> network?

<u>What</u> terminals? Then the Examiner's description stops talking about Best combined with Avizienis, and in parentheses confides what Avizienis (<u>alone</u>) describes.

The Appellant respectfully notes that in the Decision of the Board, these guarded steps are hurdled, and the Deci-

The Appellant respectfully notes that in the Decision
of the Board, these guarded steps are hurdled, and the Deci-
sion leaps forward to conclude, as pointed out earlier (em-
phasis added):

> "[T]he Examiner's proffered combination of Best and
> Avizienis <u>is</u> merely a combination of familiar (el-
> ements (i.e., a network of components having ter-
> minals, circuits for operating programs to guard
> the system from failure, and circuits for reacting
> to an error message (*cf.* claim 33)) . . . ."

Now again back to Examiner Bonzo's text: in the next
paragraph the Examiner's Answer repeats this rather elusive
pattern (emphasis added):

> "at least one of the <u>network</u> <u>terminals</u> is <u>connected</u>
> to provide one recovery signal to such system upon
> receipt of the error signal (page 1498 describe
> [*sic*] the use of the local executive processing
> faults and providing and [*sic*] solution to the
> problem; . . . ."

Here too, the Examiner's text at first says only that "one
of the <u>network</u> terminals is <u>connected</u>" to provide a recovery
signal.

What <u>network</u>?

There <u>is no</u> network — and these lacunae cannot be
cured by suggesting that the Appellant is arguing the refer-
ences separately. Rather, Appellant challenges the reality
of the combination — the Examiner's account of the "prof-
fered" combination.

What terminal? There is no terminal, either.

Neither the grounds of rejection stated by the Examiner
nor those stated by the Board Decision squarely confront
these allusions to components that are actually involved —
either in the present invention or in the references.

Also in the Decision there appears a citation to *KSR Int'l Co. v. Teleflex Inc.* This case is often cited for "the need for caution in granting a patent based on the combination of elements found in the prior art".

The Supreme Court's overriding advice, however, is <u>not</u> simply to go forth and refuse patents, but rather to exercise "caution" — and, above all, the Court says, to use "common sense". Based upon the several concrete examples, above, of strictly well-known terms of art in the computer world being drastically misunderstood or misused, the Appellant most respectfully submits that a review of the basic features of the present invention, and of the cited references, might be helpful.

For this purpose, Appellant suggests the Appellant's response mailed May 12, 2006 — particularly at pages 48 (starting with the two bulleted paragraphs at bottom) through 54.

SECONDARY ISSUE

In the Board's Decision, it is said (page 21, emphasis added; please see also pages 12 & 13):

> "'such computer system' <u>could refer</u> to a <u>different</u> computer system than the protected computer system, <u>perhaps a similar</u> computer system".

In response, the Appellant respectfully asks how this kind of interpretation could possibly arise in view of the explicit definition of "such" in the specification as originally filed — particularly at:

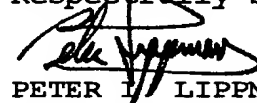page 7, lines 8 through 16,

<u>plus</u> explicit statements about the nature of the inventions of claims 1 and 4, respectively — particularly in the specification at:

page 11, lines 5 through 12.

FILING OF A CONTINUATION

Appellant Avizienis notes the requirement that the Appellant inform the Board if a Continuation application is to be filed. The Appellant has, concurrently with this Request for Reconsideration, filed a Continuation.

Respectfully submitted,

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January 4, 2010

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